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March 16, 2005

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APPLICATION NUMBER: 60/551,586

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By Authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS




TRUDIE WALLACE

Certifying Officer



16523 U.S. PTO

PROVISIONAL APPLICATION FOR PATENT COVER SHEET

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Mail Stop Provisional Patent Application
Commissioner for Patents
P.O.Box 1450
Alexandria, VA 22313-1450

Sir:

This is a request for a Provisional Application for Patent under
37 C.F.R. 1.53 c:

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TITLE: Method to Identify Calls Between Remote VoIP Subscribers Connected via a Transit PSIN and
Reconnect as End-to-End VoIP

This provisional application includes:

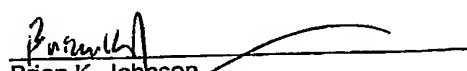
- 11 pages: specification, sheets of drawings, flowchart
— photographs (design patent application only)

Please charge Siemens Deposit Account No. 19-2179 in the amount of \$160.00 for the provisional application filing fee. The Commissioner is hereby authorized to charge payment and any additional filing fees required under 37 C.F.R. 1.16 and any provisional patent application processing fees under 37 C.F.R. 1.17 that are associated with this communication or credit any overpayment to Deposit Account No. 19-2179.

This invention was **not** made by an agency of the U.S. Government or under the contract with any agency of the U.S. Government.

Dated: March 9, 2004

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IDNR: 7049 / V: 03-1.01 / B:Val

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PROVISIONAL PATENT APPLICATION

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TITLE OF INVENTION:

Method to Identify Calls Between Remote VoIP Subscribers
Connected via a Transit PSIN and Reconnect as End-to-End
VoIP

IDNR: 7084 / V: 03.06.06 / B: Val

TO WHOM IT MAY CONCERN, THE FOLLOWING IS
A SPECIFICATION OF THE AFORESAID INVENTION

Patent Title

**Method to shortcut
Transient TDM
in an IP to IP call**

Problem

TDM network dominates the voice telephony presently. With the expansion of IP-network and its VoIP application, it is foreseen that the two networks coexist in the next decade with TDM-network losing its dominance gradually. Till that day comes, TDM shall dictate its rules and regulations on the way of telephony. For example the very first dictation is the number dialing dictated by the TDM. In a pure IP-world, telephone connection may be initiated by name dialing. Since the two networks have to be able to interwork with each other, TDMs digit dialing rules the connection routing. For example if a TDM subscriber wants to establish a connection to an IP-subscriber, even though IP-subscriber may have the name dialing capability, the TDM-subscriber has only one way of addressing the IP-subscriber. In another example, if a TDM subscriber is represented in the IP-world by a name, and even though the IP-subscriber can address this TDM-subscriber by name, prior to presenting this call to a TDM-switch, the name has to be converted to digits. Moreover, presently every IP-subscriber that is introduced, is presented at least by a directory number (digit dialing). Thus, at the moment the following holds true:

If an IP-centrex subscriber wants to call another IP-centrex subscriber from other branch exchange, it is forced to dial digits. This may well change in future, but at the moment this is the rule. For this reason, there are multiple scenarios that two IP-subscribers calling each other inevitably have to pass through TDM network (at least once).

The following example crystallizes the dependency on the TDM rule:

If a TDM-subscriber wishes to keep its well known number while moving to IP network; i.e. become an IP-subscriber while keeping the number, every call to this number has to terminate first in the old TDM office, and then triggers the Line Number Portability (LNP) and gets translated and finally routed to the new office. This example illustrates the fact that existence of one TDM switch in the whole network, may cause an IP to IP call to have to cross the TDM network.

Having mentioned this scenario, the obligation of passing through TDM network for two IP-subscribers introduces additional restriction; namely to their capabilities such as not being able to perform pure IP-features. As an example, the two IP-subscribers shall not be able to exchange images due to their unawareness of each other's IP-nature. With the above description, a solution, which could shortcut the IP to IP call, is well appreciated.

Apart from the fact that less resources have been seized (TDM resources), If such solution is in place, then other advantages shall be applicable. For example TDM rigid regulations may not apply anymore to such IP to IP calls.

Solution

The heart of the problem discussed above lays in the fact that the two end IP-subscribers are not aware from each other's nature. Hence if they could be aware then the TDM could be bypassed and IP features could come in picture. The method

presented here uses TDM resources to convey the necessary information about the nature of originator. The data needed to identify the originator shall consist of:

- The capability of applying "method to shortcut transient TDM in an IP to IP call" (MTS Method)
- Information about the originator or his agent
- A reference to designated call

The solution presented here uses "user-user-information element" conveyed in ISDN to carry the above data from originator to the terminator. The figure below visualizes a call scenario from an IP-subscriber to an IP-subscriber. This call has been routed through the TDM network because the two IP networks depicted below, network1 and network2 may not know each other's nature. The two IP network may even know from each other's nature, but they may have no other routing information than TDM routing information.

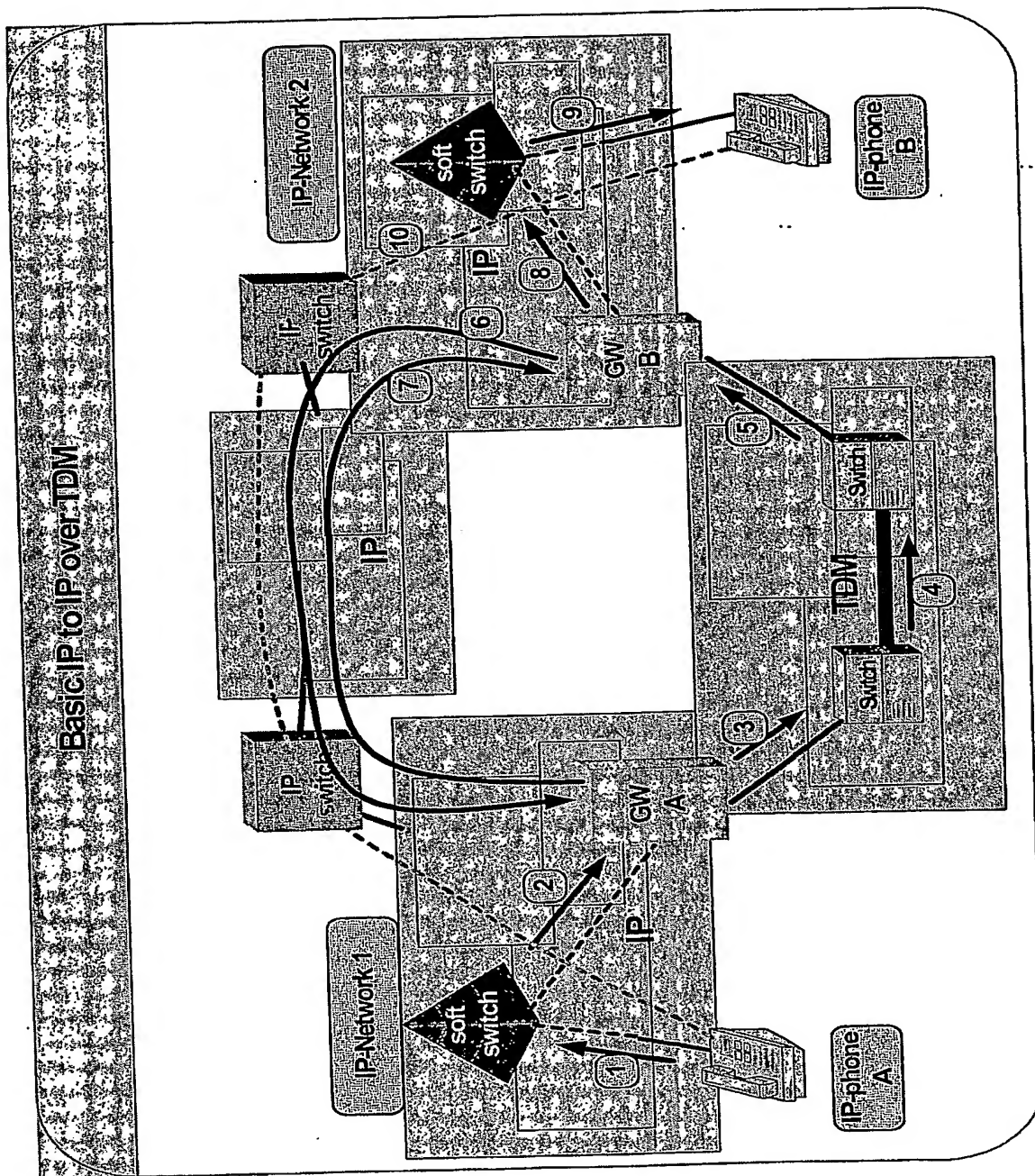


Figure 1

figure 1 depicts a call flow using "MTS Method" as follow:

- 1- IP-initiate call message (e.g SIP:INVITE)
 - 2- Call agent initiates call toward TDM network via gate way
in the scenario above GW connection to TDM is ISDN (PRI) connection
 - 3- GW-A initiates ISDN:SETUP with User-User-info containing tags:
 - A- nature indication (to indicate the capability to apply "MTS Method ")
 - B- GW-A IP address
 - C- a unique Call Reference within the GW-A associated with the ongoing call
 - 4- TDM-network transports this user-user-information transparently to the TDM-terminating office
 - 5- TDM terminating office initiates an ISDN setup (with UUI) to GW-B
 - 6- Should the GW-B be capable to recognize the applied method indicated in UUI, then it may initiate an IP connection to the GW-A using the IP address in UUI. The GW-B shall include the following information in this message:
 - A- nature indication (to indicate the capability of GW-B, can be used for negotiation)
 - B- GW-B IP address
 - C- the unique Call Reference created by GW-A
 - D- a unique Call Reference within the GW-B associated with the ongoing call
 - 7- GW-A responds to GW-B (e.g SIP:INVITE)
 - 8- GW-B delivers the call-initiation to the B-subscriber's call agent
 - 9- the call is finally presented to the B-subscriber
 - 10- connection may be established at this point
- from point 7 On, the TDM seized resources could be released.

The above flow diagram does not present the complete call flow.

Obviously this method can also be applied in a higher hierarchy level than GW, for example in a softswitch. This is depicted in the figure 2.

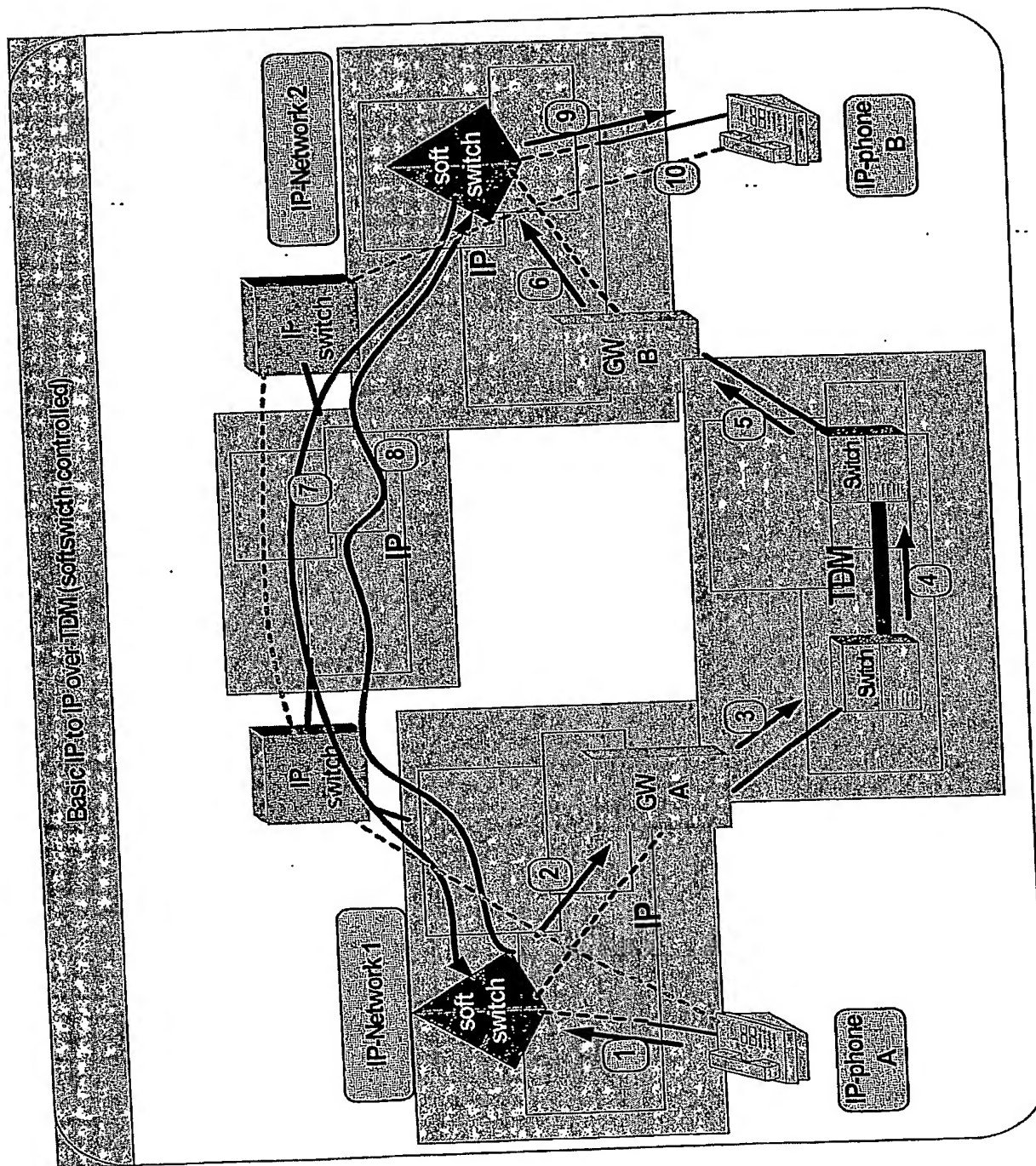


Figure 2

figure 2 depicts a call flow using "MTS Method" as follow:

- 1- IP-initiate call message (e.g SIP:INVITE)
 - 2- Call agent (CA) initiates call toward TDM network via gate way. This CA in softswitch includes following information:
 - A- nature indication (to indicate the capability to apply "MTS Method ")
 - B- GW-A IP address
 - C- a unique Call Reference within the GW-A associated with the ongoing call which is for the GW to be packed into a UUI in the outgoing ISDN: SETUP.
 - 3- GW-A initiates ISDN:SETUP with UUI containing tags from above.
 - 4- TDM-network transports this user-user-information transparently to the TDM-terminating office
 - 5- TDM terminating office initiates an ISDN setup (with UUI) to GW-B
 - 6- GW-B delivers the incoming ISDN setup to the call control in softswitch (it includes the UUI).
 - 7- Should the softswitch in IP-network 2 be capable to recognize the applied method indicated in UUI, then it may initiate an IP connection to the softswitch in IP-network 1 using the IP address in UUI. The softswitch in IP-network 2 shall include the following information in this message:
 - A- nature indication (to indicate the capability of GW-B, can be used for negotiation)
 - B- softswitch in IP-network 2 address
 - C- the unique Call Reference created by softswitch in IP-network 1
 - D- a unique Call Reference within the softswitch in IP-network 2 associated with the ongoing call
 - 8- softswitch in IP-network 1 responds to GW-B (e.g SIP:INVITE)
 - 9- softswitch in IP-network 2 delivers the call-initiation to the B-subscriber's call agent
 - 10- the call is finally presented to the B-subscriber
 - 11- connection may be established at this point
- from point 8 On, the TDM seized resources (including the both GW resources) could be released.

The above flow diagram does not present the complete call flow.

A combination of these scenarios is also possible, for example on the A-side the GW-A may apply the "MTS method" and on the terminating side the softswitch in IP-network 2 may recognize and apply the "MTS method".

Applying this method, the pre defined barriers and restrictions of network are removed.

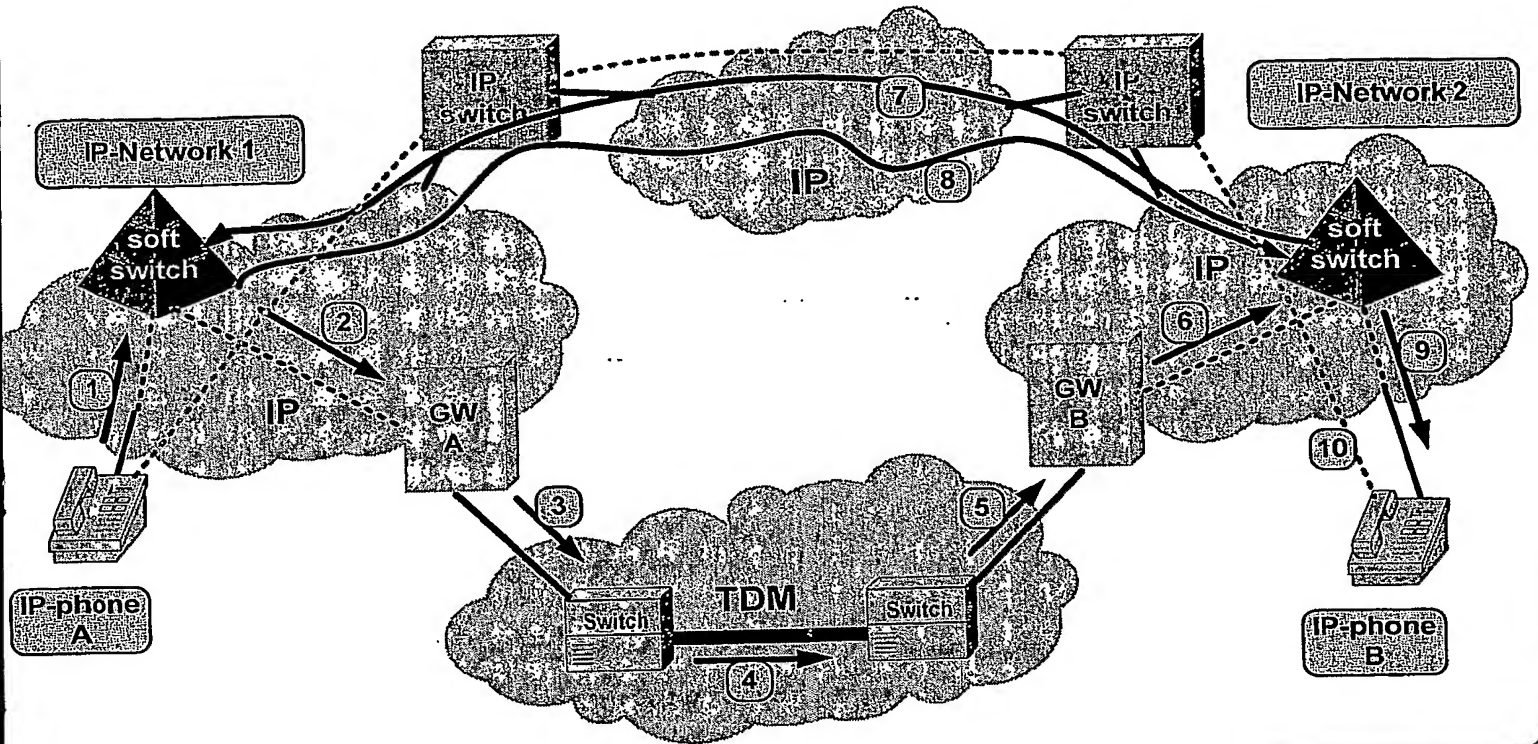
FEASIBILITY

Feasibility

Formulation of Patents

This paper intends to register a patent for :

Basic IP to IP over TDM (softswitch controlled)



Basic IP to IP over TDM

